



October 6, 2005

Mr. Richard Krolak  
Chief, CalPERS Office of Long Term Care  
400 P Street, 5<sup>th</sup> floor  
Sacramento, CA 95814

Subject: Actuarial Valuation of the CalPERS Long Term Care Program  
as of June 30, 2005

Dear Mr. Krolak:

I have attached a report summarizing the results of our actuarial valuation of the CalPERS Long Term Care Program as of June 30, 2005. Please note that this report is not meant to serve as complete actuarial documentation. Much additional relevant data/information is available for distribution and can be provided upon request.

This report is organized as follows:

- The first section presents an executive summary of the valuation results and recommendations.
- The following sections present:
  - Scope and background information.
  - The approach used for this valuation.
  - A discussion of revised morbidity assumptions.
  - Information regarding model construction and fit.
  - Projection results – base case and sensitivity testing.
  - Recommendations.
- The last two sections include a discussion of an opportunity for improvement and a summary of caveats and/or limitations applicable to this valuation.

Additional details are provided in various attachments as described in the report.

#### **Acknowledgments**

I would like to acknowledge the efforts of my staff members, who assisted me with nearly every aspect of this project:

Constance D. Rogers, ASA, MAAA  
Max A. Klicker, ASA, MAAA  
Jevon Brenneman

**Actuarial Valuation of the  
California Public Employees Retirement System  
Long Term Care Program  
As of 6/30/05**

Prepared by:

Karl G. Volkmar, FSA, MAAA, FCA  
Consulting Actuary  
United Health Actuarial Services, Inc.

October 6, 2005



December 19, 2005

Mr. Richard Krolak  
Chief, CalPERS Office of Long Term Care  
400 P Street, 5<sup>th</sup> floor  
Sacramento, CA 95814

Subject: Actuarial Valuation of the CalPERS Long Term Care Program  
as of June 30, 2005

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Max A. Klicker, ASA, MAAA  
Jevon Brenneman

I would also like to acknowledge the efforts of the Long Term Care Group's (LTCG's) actuarial area led by Peggy Hauser, FSA, MAAA. As is discussed in our report, this valuation was very much a joint effort between UHAS and LTCG actuarial staff, and the LTCG actuarial staff's knowledge and expertise, both in general and specific to this block, combined with their cooperative approach added significant value to this project and this report.

**Conclusion**

Please feel free to contact me directly to discuss anything presented in this report at (317)575-7672 or via e-mail at [kvolkmar@uhasinc.com](mailto:kvolkmar@uhasinc.com).

Sincerely,

A handwritten signature in black ink, appearing to read 'Karl G. Volkmar', with a stylized, cursive script.

Karl G. Volkmar, FSA, MAAA, FCA  
Consulting Actuary

**Actuarial Valuation of the  
California Public Employees Retirement System  
Long Term Care Program  
As of 6/30/05**

Prepared by:

Karl G. Volkmar, FSA, MAAA, FCA  
Consulting Actuary  
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December 19, 2005

### **Executive Summary**

United Health Actuarial Services, Inc. (UHAS) was retained by the California Public Employee Retirement System (CalPERS) Long Term Care (LTC) Program through the Long Term Care Group (LTCG) to perform an actuarial valuation of the LTC operations of CalPERS as of June 30, 2005, along with any supporting analyses. Specifically, our assignment was to develop a projection of future cash flows and to evaluate the adequacy of current assets and premium levels based on those cash flows.

Given that LTCG's actuaries developed the most recent annual valuation and the fact that we had full access to their personnel and details with respect to their past valuation efforts, we chose to utilize LTCG's 2004 annual valuation and subsequent updates as the starting point for the development of the 2005 valuation.

Briefly, our 2005 valuation process could be summarized as follows:

- Compared/validated UHAS model vs. LTCG model for a sample cell.
- Obtained and reviewed LTCG assumptions from 2004 valuation and subsequent updates.
- Updated detailed morbidity study developed for 2004 valuation using actual program experience through 6/30/05.
- Developed revised ultimate claim cost assumptions by credibility-weighting adjusted actual program claim costs with LTCG's manual ultimate claim costs.
- Validated resulting claim costs to historical incurred claims experience using UHAS' validation process, and developed selection factors as part of that process such that the proposed morbidity assumptions approximately reproduced historical incurred claims.
- Validated resulting claim costs, selection factors, etc., to historical incurred claims experience using LTCG's validation process.
- Input assumptions into model and ran model for all scenarios to be tested.

Please note that LTCG's actuarial personnel performed their own parallel valuation as of 6/30/05. We attempted to keep our valuations as consistent as possible, but we were unable to do so in some cases due to (for example) differences in modeling, approaches to assumption development, and actuarial judgment. LTCG personnel would be able to answer any questions regarding their valuation work.

Please note that our primary assumption revision(s) from last year's valuation related to assumed morbidity. This will be discussed in more detail later in this report.

Given all of the above, we developed projected values using a seriatim projection model and we used those projected values along with current program financial information to determine the financial standing of the program.

### **Projection Results**

In summary, due to the range of scenario testing presented in this report, projected results varied widely. Projection results are very sensitive to the underlying assumptions used.

Please see the report and Attachment A for a detailed discussion of projection results.

### **Recommendations**

Based on all of the data/information presented above and in more detail later in this report, we recommend the following:

- Implement one or more initiatives effective as soon as possible that, in the aggregate, would impact projected future results in a manner consistent with the impact of a 20% rate increase.

Please note that an addendum to this report will soon be released that will present a number of proposed initiatives for consideration.

- Establish a task force to develop a plan to identify all key areas of opportunity and one or more ways to address each of those areas. Included in this discussion would be a frank discussion of what type(s) of corrective actions could be taken.
- Perform a detailed actual-to-expected analysis comparing actual program experience through 6/30/05 to original pricing assumptions. This would allow for a better understanding the source(s) of the deteriorating projection results.
- Develop a detailed monitoring and reporting system that compares all key emerging experience items against (at least) pricing assumptions and corresponding assumptions from the most recent valuation.
- Consistent with one of last year's recommendations, review the current surplus guidelines and develop proposed revisions to those guidelines.

### **Conclusion**

Again, all of this will be discussed in more detail later in this report.

## **Report**

This report summarizes the results of our actuarial valuation of the CalPERS Long Term Care Program as of June 30, 2005. Please note that this report is not meant to serve as complete actuarial documentation for this valuation. Additional data/information can be provided upon request.

## **Scope and Background Information**

United Health Actuarial Services, Inc. (UHAS) was retained by the California Public Employee Retirement System (CalPERS) Long Term Care (LTC) Program through the Long Term Care Group (LTCG) to perform an actuarial valuation of the LTC operations of CalPERS as of June 30, 2005, along with any supporting analyses. Specifically, our assignment was to develop a projection of future cash flows and to evaluate the adequacy of current assets and premium levels based on those cash flows.

Given that LTCG's actuaries developed the most recent annual valuation and the fact that we had full access to their personnel and details with respect to their past valuation efforts, we chose to utilize LTCG's 2004 annual valuation and subsequent updates as the starting point for the development of the 2005 valuation.

## **Valuation Approach**

Briefly, our 2005 valuation process could be summarized as follows:

- Compared/validated UHAS model vs. LTCG model for a sample cell.
- Obtained and reviewed LTCG assumptions from 2004 valuation and subsequent updates.
- Updated detailed morbidity study developed for 2004 valuation using actual program experience through 6/30/05.
- Developed revised ultimate claim cost assumptions by credibility-weighting adjusted actual program claim costs with LTCG's manual ultimate claim costs.
- Validated resulting claim costs to historical incurred claims experience using UHAS' validation process, and developed selection factors as part of that process such that the proposed morbidity assumptions approximately reproduced historical incurred claims.
- Validated resulting claim costs, selection factors, etc., to historical incurred claims experience using LTCG's validation process.
- Input assumptions into model and ran model for all scenarios to be tested.

Each of these steps is reiterated below and is discussed in more detail.

- *Compared/validated UHAS model vs. LTCG model for a sample cell.*

Given that we wanted to utilize LTCG valuation work as a starting point for our efforts, we wanted to make sure that our respective models would develop consistent results given identical (or consistent) assumptions. Using data and assumptions from an actual model cell LTCG developed in conjunction with their updated valuation work as of 12/31/04, we compared period-by-period and



present values of projected premiums, LTC claims, return-of-premium (ROP) claims, and expenses. Using identical (or consistent) assumptions, the two models developed consistent projection results for each of these items. Therefore, we concluded that we should not expect any significant change in projection results resulting from a move from LTCG's model to UHAS' model.

- *Obtained and reviewed LTCG assumptions from 2004 valuation and subsequent updates.*

We obtained and reviewed all of the key assumptions that LTCG used in the 2004 valuation and subsequent updates. Please note that LTCG had updated a number of assumptions from those used in its 2004 annual valuation in its subsequent update of that valuation as of 12/31/04, and we used the most current version of each assumption as the starting point for our valuation work.

We reviewed the following assumptions to varying degrees in our preparation for this valuation:

- Morbidity, including ultimate claim costs, selection factors and associated adjustments.
- Voluntary lapse assumptions.
- Mortality assumptions.
- Expense assumptions.

Our review of assumed morbidity is discussed later in this report. Revisions to other assumptions were made as deemed necessary.

- *Updated detailed morbidity study developed for 2004 valuation using actual program experience through 6/30/05.*

In support of LTCG's efforts in 2004, we developed morbidity studies using actual program experience. Our studies included the following:

- Incidence and continuance analyses.
- Ultimate claim cost analyses.
- Selection factor analyses.

While we updated all of these studies using data through 6/30/05, the focus of my discussion here will be on the second item.

For all benefit designs we explicitly modeled (i.e., policy type/benefit period/inflation status combinations), we performed detailed claim cost analyses and then adjusted assumed claim costs based on the results of those analyses.

We used the following approach with respect to our ultimate claim cost analyses:

- Using source coverage and claims data files from LTCG and given relevant direction from LTCG actuarial personnel, we developed complete exposure and claims databases for the program.
- We added provision for claim reserves (on a seriatim basis) and incurred but not reported (IBNR) claim liabilities (allocated across inforce based on premium) to the claims database. Please note that we used claim liabilities and reserves calculated by LTCG because our results were relatively consistent with their results in the aggregate, because their results were based on more extensive experience with the program, and because we did not want this (or any) assumption to differ unless there was strong basis to do so and the impact would be material.
- We generated incurred claim summaries by attained-age band and duration, and then used those to develop “gross-up factors” by attained-age band and duration that were used to gross up incurred claims for earlier durations to estimated ultimate levels. While these gross-up factors were developed from actual experience, industry selection wear-off patterns were also considered when determining the lengths of the selection periods as well as the ultimate selection factors for each issue-age band.
- All incurred claims were grossed up as indicated above.
- We developed a summary of estimated ultimate incurred claim costs by attained-age band and gender for all benefit designs we explicitly modeled.

We used the resulting estimated ultimate claim costs as described in the subsection immediately below.

- *Developed revised ultimate claim cost assumptions by credibility-weighting adjusted actual program claim costs with LTCG’s assumed ultimate claim costs.*

The estimated ultimate male and female claim costs referenced above for pivotal ages 47, 57, 62, 67, 72, 77, 82 and 87 were adjusted such that they were on the same basis as LTCG manual ultimate claim costs, and the resulting adjusted claim costs were credibility-weighted with the corresponding LTCG manual ultimate claim costs to develop the assumed ultimate claim costs.

The credibility standards we applied were taken from the results of an analysis dated 5/28/03 performed by an industry “credibility subgroup”. For credibility-weighting purposes, we considered “full credibility” to mean that there would be a 90% probability that estimates would fall within 10% of the expected count, and we used appropriate program data to translate that standard into minimum claim counts needed within a given cell in order to achieve full credibility. We ascribed partial credibility within a given cell based on the relationship between actual claim counts and “full credibility” claim counts; however, any actual claim volume that resulted in less than a 20% credibility-weighting to actual experience was ignored entirely.

The new assumed ultimate claim costs between the pivotal ages were developed using constant force interpolation. Corresponding claim costs for attained-ages 37 and younger and 97 and older were set at LTCG's previously assumed ultimate claim costs. Claim costs between 37 and 47 and between 87 and 97 were developed using constant force interpolation.

- *Validated resulting claim costs to historical incurred claims experience using UHAS' validation process, and developed selection factors as part of that process such that the proposed morbidity assumptions approximately reproduced historical incurred claims.*

In order to validate the credibility-weighted claim costs referenced above, we calculated historical benefit-adjusted exposures by attained-age band and duration for the largest projection cell, and input our proposed morbidity assumptions to assess how effectively they reproduced historical experience. Initial proposed selection factors were revised to optimize the match between actual and "expected" claims (i.e., those based on proposed morbidity assumptions).

- *Validated resulting claim costs, selection factors, etc., to historical incurred claims experience using LTCG's validation process.*

To double-check the validity of the projection fit, we input the proposed morbidity assumptions resulting from our validation process into LTCG's validation process. The results of this second analysis indicated that the projection fit was reasonable.

- *Input assumptions into model and ran model for all scenarios to be tested.*

Results of the "base case" run along with results from other scenarios are summarized later in this report.

A summary of relevant valuation assumptions is included as Attachment B.

Please note that LTCG's actuarial personnel have performed their own parallel valuation as of 6/30/05. We attempted to keep our valuations as consistent as possible, but we were unable to do so in some cases due to (for example) differences in modeling, approaches to assumption development, and actuarial judgment. LTCG personnel would be able to answer any questions regarding their valuation work.

#### **Discussion of Revised Morbidity Assumptions**

Our primary assumption revision(s) from last year's valuation relate to assumed morbidity. These assumptions were revised as follows:

- Ultimate claim costs were revised as described above.
- Revised selection factors were developed as described above.

- Claim payment distributions (i.e., assumed payment patterns associated with assumed claim costs) were revised to reflect emerging experience and were developed to be consistent with current liability/reserve levels.
- Both the application of and amounts associated with the adjustments to reflect reduced exposures due to individuals already on claim have been revised.
- Future morbidity improvement has been assumed to proceed 20 years from the valuation date versus 20 years from policy issue.

These revisions collectively result in a significant increase in projected future claims for the program as compared to the 2004 valuation. Please note that if experience continues to emerge in a manner consistent with how experience has emerged to date, valuation results will continue to deteriorate.

All other assumptions are substantially similar to those utilized in the 2004 annual valuation.

### **Model Construction and Fit**

Given everything presented above, we developed projected values using a proprietary seriatim projection model.

We created a projection model to replicate the historical lives in force, premiums collected and claims incurred. We modified input assumptions until the model was able to replicate the past. Assumptions are documented in Attachment B.

### **Projection Results – Base Case & Sensitivity Testing**

The “base case” projection results are summarized in Attachments A(1) and A(2). Attachment A(1) summarizes base case projection results without the necessary effective rate increase in place, while Attachment A(2) summarizes results reflecting a 64% rate increase.

The following outlines the assumption changes (as compared to the base case scenario) associated with the projection results summarized in Attachments A(3) through A(18):

- |                    |   |
|--------------------|---|
| Attachment A(3) -  | Investment/discount rate changed to 7.79%; no rate increase.  |
| Attachment A(4) -  | Investment/discount rate changed to 7.79%; 40% rate increase.   |
| Attachment A(5) -  | LTC base policy claims reduced by 10%; no rate increase.  |
| Attachment A(6) -  | LTC base policy claims reduced by 10%; 42% rate increase.   |
| Attachment A(7) -  | Model expenses reduced by 20%; no rate increase.  |
| Attachment A(8) -  | Model expenses reduced by 20%; 61% rate increase.   |
| Attachment A(9) -  | Investment/discount rate changed to 7.79%, LTC base policy claims reduced by 10%, and model expenses reduced by 20%; no rate increase.  |
| Attachment A(10) - | Investment/discount rate changed to 7.79%, LTC base policy claims reduced by 10%, and model expenses reduced by 20%; 18% rate increase. |
| Attachment A(11) - | Investment/discount rate changed to 6.00%; no rate increase.  |

- Attachment A(12) - Investment/discount rate changed to 6.00%; 99% rate increase.  
Attachment A(13) - LTC base policy claims increased by 10%; no rate increase.  
Attachment A(14) - LTC base policy claims increased by 10%; 85% rate increase.  
Attachment A(15) - Model expenses increased by 20%; no rate increase.  
Attachment A(16) - Model expenses increased by 20%; 66% rate increase.  
Attachment A(17) - Investment/discount rate changed to 6.00%, LTC base policy claims increased by 10%, and model expenses increased by 20%; no rate increase.  
Attachment A(18) - Investment/discount rate changed to 6.00%, LTC base policy claims increased by 10%, and model expenses increased by 20%; 127% rate increase.

A brief summary of projection results is included below:

Scenario	Rate Increase	Deficit	LTC Claim Adj.	Model Expense Adj.	Investment Discount Rate
A(1)	0%	-63.14%	0%	0%	7.00%
A(2)	64%	+0.53%	0%	0%	7.00%
A(3)	0%	-39.04%	0%	0%	7.79%
A(4)	40%	+0.69%	0%	0%	7.79%
A(5)	0%	-41.63%	-10%	0%	7.00%
A(6)	42%	+0.26%	-10%	0%	7.00%
A(7)	0%	-60.49%	0%	-20%	7.00%
A(8)	61%	+0.31%	0%	-20%	7.00%
A(9)	0%	-16.96%	-10%	-20%	7.79%
A(10)	18%	+0.88%	-10%	-20%	7.79%
A(11)	0%	-98.71%	0%	0%	6.00%
A(12)	99%	+0.15%	0%	0%	6.00%
A(13)	0%	-84.65%	+10%	0%	7.00%
A(14)	85%	+0.19%	+10%	0%	7.00%
A(15)	0%	-65.78%	0%	+20%	7.00%
A(16)	66%	+0.13%	0%	+20%	7.00%
A(17)	0%	-126.01%	+10%	+20%	6.00%
A(18)	127%	+0.44%	+10%	+20%	6.00%

As you can see, the program's estimated financial standing is highly sensitive to the underlying assumptions.

Please note that we did not perform a specific valuation of 2005 new business for the following reasons:

- New business rates were just re-priced for 2005.
- New business would constitute a relatively small portion of the total block.
- There were significant issues associated with the inforce business issued through 6/30/05, so we focused our review on those policies.

We did, however, review the new 2005 rates for reasonableness.

### **Recommendations**

Based on all of the data/information presented in this report, we recommend the following:

- Implement one or more initiatives effective as soon as possible that, in the aggregate, would impact projected future results in a manner consistent with the impact of a 20% rate increase.

Please note that an addendum to this report will soon be released that will present a number of proposed initiatives for consideration.

While the majority of the projection scenarios discussed above would indicate the need for an impact on future projection results greater than that afforded by a 20% increase, my recommendation is based on the following:

- It is not unreasonable to utilize the expected long-term investment rate for projection assumption purposes, and especially so given recent investment results and the sensitivity of projection results to this assumption.
- The variability and sensitivity associated with the morbidity and expense assumptions.
- While it would be prudent to respond quickly to the emerging morbidity experience, I do not believe it would be in the best interest of the program to overreact to that experience.

The only scenario that indicates the need for a rate increase of less than 20% is one where the actual experience for all tested assumptions compares favorably to projection assumptions. Given current trends in program morbidity experience, I believe that this scenario is unlikely to occur.

Please let me know if you would like to discuss any of this in more detail.

- Establish a task force to develop a plan to identify all key areas of opportunity and one or more ways to address each of those areas. Included in this discussion would be a frank discussion of what type(s) of corrective actions could be taken.
- Perform a detailed actual-to-expected analysis comparing actual program experience through 6/30/05 to original pricing assumptions. This would allow for a better understanding the source(s) of the deteriorating projection results.
- Develop a detailed monitoring and reporting system that compares all key emerging experience items against (at least) pricing assumptions and corresponding assumptions from the most recent valuation.

- Consistent with one of last year's recommendations, review the current surplus guidelines and develop proposed revisions to those guidelines.

#### **Opportunity for Improvement - Sample**

We will certainly improve our valuation process as we gain more experience with the program, its structure, its operation, etc. One area for improvement that could be worked on between valuations is the claim liability and reserve development process. Given that emerging experience is gaining credibility and that claim liability and reserve estimates make up a significant portion of inception-to-date actual incurred claims, refining our estimates of these values would add a greater degree of accuracy to our valuation morbidity assumptions.

#### **Caveats and Limitations**

Please note the following caveats and limitations with respect this valuation and this report:

- This report has been prepared for the internal use of CalPERS. This report may not be distributed, disclosed, copied, or otherwise furnished to any other party without UHAS's prior consent.
- UHAS has performed the work assigned and prepared this report assuming it will be utilized by persons technically competent in the areas addressed and for the stated purpose. Judgments should be made only after studying this report in its entirety. I am available to explain and/or amplify anything presented in this report, and it is assumed that the user of this report will seek such explanation and/or amplification regarding any matter in question.
- Nothing included in this report is to be used in any filings with any public body such as the Securities and Exchange Commission or State Insurance Departments, without prior written approval from UHAS. Any distribution of this report must be in its entirety.
- We relied on data and information supplied by CalPERS and LTCG data services personnel. We have not audited or independently verified the information furnished to us. Although we have no reason to suspect the integrity of the underlying data, to the extent that the data is materially flawed, the results of our analysis may be materially impacted. The principal materials relied upon include:
  - Data extracts from LTCG's administrative system.
  - Information contained in previous valuation reports and associated correspondence and documentation.
  - Financial information for the program from inception through 6/30/05.
  - Information/analyses/summaries/etc. provided by LTCG.

- The assumptions underlying the projection results summarized in this document and attachments are based on program data and experience, industry data and experience, discussions with program management, and informed judgment. I believe the assumptions used are reasonable in the aggregate based on the data/information I have and based on my experience; however, future experience will invariably be different from the projected experience, and other knowledgeable individuals could have different opinions about the appropriateness of any or all of the assumptions used.
- The validity of these projections depends on how actual future experience compares to the valuation assumptions. Assumptions for future morbidity, persistency, expenses, investment return, and other factors are based upon our evaluation of recent experience and anticipated future trends. Actual experience could be more or less favorable. To the extent that actual experience differs from the assumptions underlying this report, actual results will differ from the projection results presented in this report.
- In preparing this report, we have complied with all relevant Actuarial Standards of Practice and any other relevant documents published by the American Academy of Actuaries.
- As indicated previously, this report is not meant to serve as complete actuarial documentation. Much additional relevant data/information is available for distribution and can be provided upon request.

### **Conclusion**

As indicated previously, please feel free to contact me with any questions at (317)575-7672 or via e-mail at [kvolkmar@uhasinc.com](mailto:kvolkmar@uhasinc.com).